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EXAMINER FERRIS, DERRICK W				
ART UNIT		PAPER NUMBER		
2663				

DATE MAILED: 10/02/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/498,204

Applicant(s)

FEUERSTEIN ET AL.

Examiner

Derrick W. Ferris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2000.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-10, 13-32, and 35-43** are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 639035 A1 to *Searle et al.* ("*Searle*") (cited on IDS) in view of "Adaptive Sector Control in a CDMA System Using Bulter Matrix" to *Mahmoudi et al.* ("*Mahmoudi*") and "Performance Enhancement of DC-CDMA Microcellular Networks with Adaptive Antennas" to *Tsoulos et al.* ("*Tsoulos*").

As to **claim 1**, *Searle* discloses a smart antenna for a base station comprising of a plurality of antenna arrays (40; Fig. 6a). In particular, figures 6 (a) and (b) provide a more detailed representation of the general blocks shown in figure 5. Specifically shown in figures 6(a) and (b) are an antenna having a plurality of transmit signals, a means for splitting each of said modulation transmitter outputs into signal components, and a means for selectively providing selected ones of said modulated transmitter output signal components to one or more of said transmitted signals using a reasonable but broad interpretation of the means plus function recitations (i.e., in particular examiner notes a very broad but reasonable interpretation).

Examiner notes *Searle* may be silent or deficient to the further recited limitations of "*wherein said plurality of transmit signals combine in free space to form a plurality of*

*variable size beams in a radiation pattern” and “means for adaptively altering an attribute of ones of said signal components prior to providing to said transmit signals, wherein a size of the beam of said plurality of variable size beams is at least in part defined as a function of a relative difference of said attribute of said signal components as provided to said transmit signals”.* Examiner notes that it would have been obvious to someone skilled in the art prior to applicant’s invention to have variable size beams defined in part as a function of relative difference of said attribute. As support, *Mahmoudi* discloses a solution to modify the already deployed fixed sector CDMA systems to an adaptive sectorized one (see abstract). In particular, *Mahmoudi* discloses using a Bulter matrix (Section III, page 1356) to create an adaptive antenna array of various sizes (examiner notes *Searle* also teaches using a Butler matrix at column 6, lines 35-56). Thus *Mahmoudi* cures the deficiency by disclosing that a Bulter matrix that may adaptively change the sizes, positions, and also the number of sectors, and obtained increase/constant capacity (Section II, page 1355). In addition, *Tsoulos* provides additional support and also cures the deficiency by disclosing that an antenna array is capable of modifying its radiation pattern, frequency response, and other parameters by means of internal feedback control (see Section III (b) at page 1087).

As to **claim 2**, see Section I, page 1355 of *Mahmoudi*.

As to **claims 3 and 4**, see column 6, lines 34-56 of *Searle*.

As to **claims 5 and 6**, both references disclose smart antenna arrays (see *Searle* column 3, lines 32-45 and *Mahmoudi* Section II, page 1355).

As to **claims 7-10**, see column 6, lines 34-56 of *Searle*.

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As to **claim 13**, see figure 6(a) of *Searle*.

As to **claims 14-17**, see column 8, lines 20-46 of *Searle*.

As to **claim 18**, see Section II on page 1355 of *Mahmoudi*.

As to **claim 19**, see Section II on page 1355 of *Mahmoudi*.

As to **claim 20**, see similar reasoning for the rejection of claims 1 and 2 (i.e., figures 6(a) and (b) show both a transmitter and a receiver such that the equivalent functions for a receiver are also taught by the reference).

As to **claim 21**, see the rejection for claim 5.

As to **claim 22**, see the rejection for claim 6.

As to **claim 23**, see figures 6(a) and (b) of *Searle*.

As to **claim 24**, see the rejection for claim 3.

As to **claim 25**, see the rejection for claim 4.

As to **claims 26-27**, see column 6, lines 34-56 of *Searle*.

As to **claims 28-29**, see column 8, lines 4-19 of *Searle*.

As to **claim 30**, see the rejection for claim 7.

As to **claims 31**, see column 8, lines 4-19 of *Searle*.

As to **claim 32**, see the rejection for claim 13.

As to **claim 35**, see the combined rejections for claim 1 and 20. In addition, with respect to “adaptively altering an attribute” for both a transmitter and a receiver see column 6, lines 45-46.

As to **claims 36-39**, see the rejection for claim 32.

As to **claim 40**, see the rejection for claim 3.

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As to **claim 41**, see the rejection for claim 4.

As to **claim 42**, see the rejection for claim 7.

As to **claim 43**, see the rejection for claim 8.

3. **Claims 11, 12, 33, 34, 44 and 45** are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 639035 A1 to *Searle et al.* ("*Searle*") (cited on IDS) in view of "Adaptive Sector Control in a CDMA System Using Bulter Matrix" to *Mahmoudi et al.* ("*Mahmoudi*"), "Performance Enhancement of DC-CDMA Microcellular Networks with Adaptive Antennas" to *Tsoulos et al.* ("*Tsoulos*") and in further view of U.S. Patent No. 5,909,460 to *Dent*.

As to **claim 11**, *Searle*, *Mahmoudi* and *Tsoulos* are silent or deficient to converting signals to an analog form (i.e., specifics taught by both references on the antenna implementation are vague). Examiner notes that it would have been obvious to someone skilled in the art to convert signals into an analog form in general. As support and motivation, *Dent* discloses going between the digital and analog domain as is well known in the art and as shown in figure 10 before sending a signal in general to an antenna array. Thus *Dent* cures the deficiency and shows that it is well known in the art to transport signals over a radio medium in analog form.

As to **claim 12**, *Searle*, *Mahmoudi* and *Tsoulos* are silent or deficient to converting transmitted signals from an intermediate to a radio frequency in general. Examiner notes that it would have been obvious to someone skilled in the art to covert each of said transmit signals from an intermediate frequency to a preselected radio frequency. Examiner notes a motivation is one of design choice. As further support,

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*Dent* discloses that IF and RF conversions are a matter of design choice [column 14, lines 3-40] and thus *Dent's* teachings cure the deficiency.

As to **claim 33**, see similar rejection for claim 11.

As to **claim 34**, see similar rejection for claim 12.

As to **claim 44**, see the combined rejection for claims 33 and 34.

As to **claim 45**, see the combined rejection for claims 11 and 12.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US005930243A discloses assigning a weight as illustrated in figure 4 of applicant's invention (i.e., applicant's figure 4 is the new subject matter added to applicant's parent for the CIP).
- US006615024B1 also discloses assigning a weight as well as propagating a parameter for determining an attribute as shown in figure 2 of reference.
- US006192256B1 also discloses assigning weights to an antenna array.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225.

The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-3900.

Derrick W. Ferris  
Examiner  
Art Unit 2663

  
DWF

  
CHI PHAM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600 9/25/03